Doll Accessories

Related Application

This application claims priority of U.S. Provisional Application Serial No. 60/420,811, filed October 24, 2002.

Field of the Invention

The present invention relates to doll accessories, more specifically, it relates to doll clothing and accessories made from a polymer material.

Description of the Related Art

The prior art provides a variety of dolls having removably attachable cloth clothing. In certain circumstances these types of doll accessories have proven unsuitable for use by young children. In general, young children, particularly in the 4-8 year old age group, desire a degree of realism in their play activities, but lack the manipulative skills necessary to correctly place cloth clothing onto dolls. One problem associated with cloth clothing is that such articles do not hold their shape when they are removed from the doll. This can make it difficult for a child to distinguish between various articles of clothing. For example, a pair of doll size pants and a doll size shirt may create confusion between pant legs and sleeves after removal from the doll. In addition, cloth accessories for a doll may be time consuming and expensive to manufacture because of the difficulty associated with stitching small objects. Cloth garments may also be easily ripped or torn during use.

Various proposals have been advanced for making doll clothing and accessories out of alternative materials. For example, U.S. Pat. No. 4,414,774 describes fabricating such articles from plastic. However, as described, each of the dolls, clothing, and accessories lack a degree of realism because they do not move, and otherwise function, in a realistic manner. For example, the doll is not a poseable doll. The doll does not have moveable joints, and is otherwise not moveable in a realistic manner. Therefore, the accessories described do not cover moveable joints, and do not function in a lifelike manner. The clothing also cannot be fitted or removed in a life-like manner like cloth clothing. The clothing must be forced onto

the doll by generally flexing an attaching ring over the waist, head, or other fixed body part of the doll.

U.S. Pat. No. 6,227,930 has attempted to deal with the problems of the previously discussed prior art by utilizing an extremely soft copolymer having an average modulus of elasticity of less than $1MN/m^2$. Doll clothing manufactured according to this prior art generally have walls of between 1 and 3mm. However, numerous drawbacks to the use of an extremely soft copolymer in conjunction with wall thicknesses of between 1 and 3mm exist. The doll clothing does not have enough rigidity for making realistic clothes for larger dolls because it is too easily stretched, and tends to snap back during use. Additionally, the manufacture of doll clothing using the suggested copolymers is relatively slow, particularly for clothing for larger dolls, because the copolymer must cool before it may be removed from a mold. Finally, the use of such copolymers creates a problem with stickticity, sometimes referred to as stiction. Stiction here refers to the friction that must be overcome before the same material, or different materials, may be slid over one another after being formed into doll clothing or doll accessories. Poor stiction characteristics in doll clothing within the prior art make it difficult for a young child to put on, or take off, clothing and accessories from a doll. For example, removing a doll's arm from a sleeve where there is a high level of stiction is difficult, and may require turning the article of clothing inside out.

These, and other problems within the prior art have been addressed to create the doll accessories that form the subject matter of the present invention.

Brief Summary of the Invention

According to a first aspect of the present invention, a toy for use in conjunction with a poseable doll having movable joints, and a height of between approximately three inches and eight inches, includes an article of doll clothing molded from a polymeric material. The polymeric material has a 100% modulus of greater than 220psi (1517 kNm^{-2}), and the article may be removeably donned onto the doll.

Brief Description of the Several Views of the Drawing

FIG. 1 is a doll with articles of doll clothing according to one embodiment of the

present invention;

FIG. 2 is a doll with doll's clothing and accessories according to another embodiment of the invention;

FIG. 3 is a doll with doll's clothing according to another embodiment of the invention; and,

FIG. 4 is an action figure with clothing and accessories according to another embodiment of the present invention.

Detailed Description of the Invention

While the invention is susceptible of embodiment in many different forms, there is shown in the drawings, and will herein be described in detail, preferred embodiments of the invention. It is to be understood that the present disclosure is to be considered as an exemplification of the principles of the invention. This disclosure is not intended to limit the broad aspect of the invention to the illustrated embodiments.

A poseable doll 10 is shown in FIG. 1. The doll 10 includes moving joints. The doll's arms 12 and legs 14 are generally moveable into various poses. Other joints may optionally be moveable, including the neck, waist, elbow, knee, or ankle.

Articles of doll clothing for use with the doll may include a doll garment such as a school uniform jumper 18, coat 20, mittens 22, hat 24, socks 26, and shoes 28. The article is preferably flexible such that it may be removed from the doll 10 by sliding it over the various appendages of the doll 10, temporarily deforming it as necessary to pull it off of the doll. The article then generally returns to its original shape. The garment may be put back onto the doll in the same manner by stretching and deforming the garment as required, while sliding it over the doll's appendages and onto the doll. When worn, the flexibility and form of the article is such that the movement of the doll is not inhibited. A number of different garments are shown in FIGS. 1-4. These include such things as a tutu 30, nun's habit 32, and cape 34.

Numerous non-clothing accessories for use in conjunction with dolls and action figures are also part of the present invention. As shown in FIGS. 1-4, accessories such as a tiara 36, armor breastplate 38, helmet 40, sword 42, and wig 44 may be used in the various embodiments of the invention.

An article of doll's clothing or a doll accessory according to the present invention

generally maintains its molded shape, but also generally has favorable elasticity characteristics that contribute to the realism of the play experience. Preferably the article is formed from a material that has a 100% modulus of elasticity of above about 60psi (413 kNm^{-2}). More preferably, above about 220psi (1517 kNm^{-2}), and generally in the range of from about 220psi to about 380psi (2344 kNm^{-2}). The material used preferably has a 200% modulus of elasticity of above about 75psi (517 kNm^{-2}). More preferably, above about 330psi (2275 kNm^{-2}), and generally in the range of from about 330psi to about 450psi (3103 kNm^{-2}). The material used preferably has a 300% modulus of elasticity of above 80psi (551 kNm^{-2}). More preferably, above about 440psi (3034 kNm^{-2}), and generally in the range of from about 440psi to about 560psi (3861 kNm^{-2}).

Articles having elasticity in the ranges provided above have been found to be superior over the prior art for use with dolls having a height of in the range of from about three inches to about eight inches. More specifically, these articles are used in conjunction with dolls and action figures of approximately six inches in height. An article of doll's clothing or accessories having elasticity which conforms with the ranges set forth above, in conjunction with a doll in these size ranges, generally provides for a realistic play pattern experience. The article generally has enough elasticity so that a young child in the age range of from approximately 4 to 8 years old can manipulate the article unto or off of the doll.

However, such clothing and accessories generally do not stretch too easily, which tends to destroy the realism of the playing experience. Materials that stretch too easily are undesirable for use in conjunction with doll's in these size ranges because a child user can create a snap back effect by deforming and suddenly releasing a portion of the garment. A child in the 4 to 8 year old range has limited strength, and use of a less easily stretched material reduces the amount of snap back encountered during use, and contributes to the realism of the playing experience in that it more closely resembles the characteristics of cloth, or other non-elastic materials, that are typically used for clothing and accessories by adult humans.

The dolls 10 used in conjunction with clothing articles and other doll accessories according to the present invention are generally formed from a polymer material, preferably polypropylene. The doll's clothing and accessories generally are formed from materials

exhibiting low sticticity, or stiction, to polypropylene, and to itself. Therefore, the clothing and other accessories will not stick to the doll, allowing the clothing and accessories to be easily slid onto, or off of, the doll. Low sticticity allows the doll clothing and accessories to be layered, as shown in FIG. 1, without constricting movement at the poseable doll's joints. In FIG. 1, the doll 10 is shown with a school uniform 18 underneath a coat 20. Another example is shown as shoes 28 over socks 26. The layering of clothing is another benefit of doll clothing and accessories according to the present invention.

An article of doll's clothing or a doll accessory according to the present invention is generally colored so as to appeal to consumers. The preferred coloration method for such an article is pigmenting of the material used to form the article. However, painting of the formed article is also contemplated, and may be used exclusive to, or in conjunction with, the use of pigmented materials.

One material which has been found acceptable for use in the molding of doll accessories according to the present invention is a partially cross-linked, chlorinated olefin interpolymer alloy. Alcryn® melt-processible rubber, manufactured by Advanced Polymer Alloys, is one example of a suitable material. Product information for such a material that has been found acceptable for use in the forming of doll clothing and accessories according to the present invention, is provided in Table 1 below.

Property (all properties measured on specimens cut from 1.9mm thick compression-molded plaques)	ASTM Test	Unit	Measurement
Specific Gravity	D471		1.06
Hardness, Durometer A	D2240	Shore A	47
100% Modulus	D412	psi	280
200% Modulus	D412	psi	390
300% Modulus	D412	psi	505
Tensile Strength	D412	psi	1000
Elongation at Break	D412	%	420
Torsion Modulus at 75° F	D1043	psi	290
Torsion Modulus at -4° F	D1043	psi	380

Tear Strength Graves (Die C) @ 72° F	D624	lb/in	110
Permanent Set (Tension)	D412	%	7
Heat Aging Resistance (Tensile Properties After 7 days At 257° F)			
100% Modulus		psi	240
Tensile Strength		psi	940
Elongation at Break		%	450
Hardness, Durometer A		Shore A	45
Low Temperature Properties			
Brittleness Temperature	D746	° F	-132
Clah-Berg Stiffness Temp., 10,000psi	D1043	° F	-78
Tabor Abrasion, Cs-17 Wheel, 1000g load	D3389	mg/1000 cycles	5
Chemical Fluid Resistance -- Volume Change	D471		
After 7 Days in Water at 212 ° F		%	7
After 7 Days in ASTM Oil No. 1 at 212 ° F		%	-39
After 7 Days in IRM 903 Oil No. 3 at 212 ° F		%	32
After 7 Days in ASTM Ref. Fuel No. B at 212 ° F		%	24
Viscosity at 300 s-1 at 374 ° F	D3835	Pa s	115
Typical Processing Temperature		° F	330

Table 1: Material Properties.

The preferred chlorinated olefin is a melt-processible rubber. A melt-processible rubber is an amorphous material generally processible by heating it to a processing temperature, and applying a shear force to the heated material. The preferred material does not have a crystalline melt point, but rather a range of temperatures at which application of a shear force causes a pseudoplastic flow known as shear thinning. The processing temperature

is preferably in the range of from about 300°F to about 375°F. Removal of the shear force preferably stops the shear thinning, solidifying the molded material. Therefore, one benefit of an article of doll clothing, or a doll accessory, according to the present invention is that the time required for cooling of a part mold in an injection molding or other molding process, and a molded article, before removal of the article from the mold is reduced or eliminated over prior art materials. This results in reduced mold cycle times, and increased throughput.

Coloring of an article of doll's clothing or accessories formed from a chlorinated olefin generally includes the addition of a color concentrate pigment to the material. Because the material is halogenated, it is generally compatible with color concentrates designed for either rigid or flexible polyvinyl chloride. Suitable color concentrates are available from such companies as the Ferro Corporation of Stryker, Ohio.

An article of doll's clothing or a doll accessory manufactured from a partially cross-linked, chlorinated olefin interpolymer alloy generally exhibits low stiction. The articles may be easily slid onto and off of the doll. The low stiction, along with the flexibility and form of the articles, preferably allow the poseable doll to move freely, even when the articles cover joints on the doll. Furthermore, multiple layers of doll clothing may be placed onto the doll without constricting movement of the doll, and allowing the clothes to slid past one another in a realistic manner.

While the specific embodiments have been illustrated and described, numerous modifications come to mind without significantly departing from the spirit of the invention, and the scope of protection is only limited by the scope of the accompanying claims.